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The ISHI Report

News from the World of DNA Forensics

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The ISHI Report

Letter from the Editor

Warm and sunny greetings from Madison, Wisconsin.

As summer winds down we are happy to share the latest edition of the ISHI Report, featuring contributions from guest authors representing diverse areas of the forensic science community.

Vanessa Lynch, the founder of DNAforAfrica provides an update on the use of advocacy outreach and forensic expertise to aid the development of DNA databases and casework programs throughout Africa.

Tiffany Roy provides advice for forensic scientists called to give courtroom testimony. She recommends defining terms that will be referenced in testimony to reduce the confusion that often arises when presenting DNA results to a lay audience.

Rachel Oefelein, Chief Scientific Officer at DNA Labs International shares helpful hints learned from moving to new laboratory facilities in just a few days. One key takeaway- having a well-developed plan is essential for a successful transition.

Jordan Nutting explores the epidemic of missing and murdered indigenous women plaguing native communities. She interviews advocates working on the issue and explores the factors complicating the quest for justice.

We were overjoyed to see so many of you interested in taking part of our first Threesis academic challenge, and were very impressed with the work that's being done by young professionals in the forensic community. All told, 11 video entries were submitted, which received a total of 7,500+ views and 1310 “likes/votes” as of the competition end date of July 31st. You can view all of the entries on page 7 of this issue. We are excited to bring new offerings to students, including a student reception at ISHI in the evening on Sunday, October 31st. More details will be made available on our website soon.

Finally, Ronaldo Carneiro da Silva Jr and colleagues describe the unprecedented efforts involved in processing samples to close a huge robbery case in Brazil. Once again, we see the power and promise of DNA typing technologies to identify criminals who might have gone unpunished only years ago.

We hope you enjoy this edition of the ISHI Report. If you would like to mix and mingle with the scientists behind the articles consider attending this year’s International Symposium on Human Identification in National Harbor, Maryland, just outside of Washington DC. Besides the informative talks and workshops, this year’s conference has an abundance of fun networking functions starting with the Welcome Reception and culminating in an evening event at the Smithsonian Natural History Museum.

You can get to know some of our speakers a little better later on in this magazine, and can see all the program details and register to attend at www.ishinews.com.

The Editorial Board

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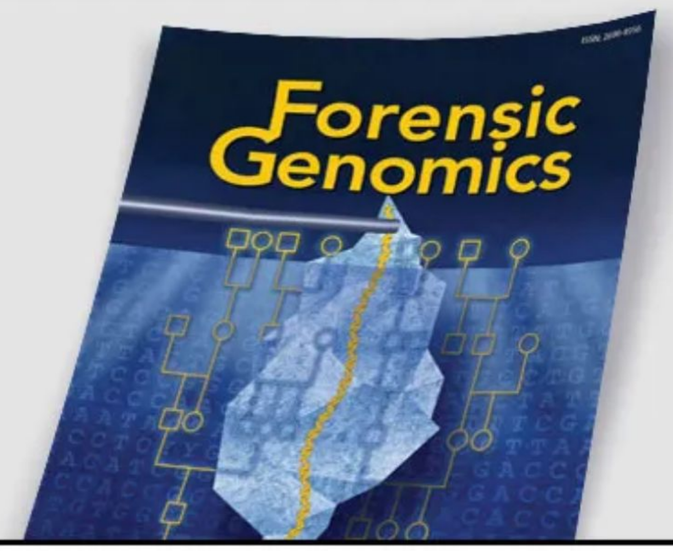

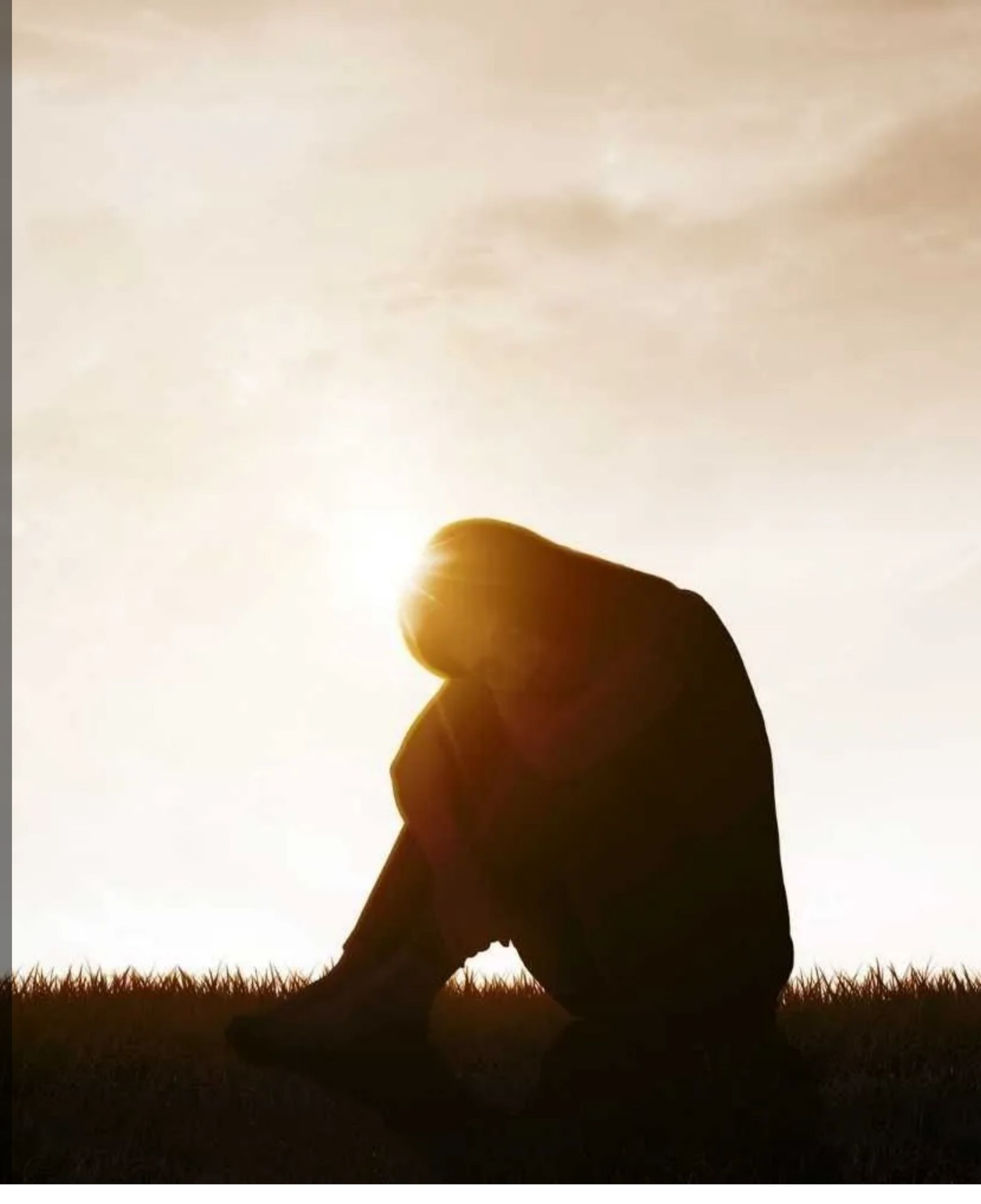

The Crisis of Murdered and Missing Indigenous Women

Jordan Nutting, Promega

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On May 5 of this year, thousands of people across the country took part in marches, forums, community gatherings, and vigils, mourning and bearing witness to a relentless tragedy. Most people at these events wore red, and some bore a red handprint painted across their mouths–a symbol for the thousands of indigenous women over the years who have been murdered or gone missing.

Women like Hanna Harris, Kaysera Stops Pretty Places, Ashley Loring Heavyrunner and unfortunately many, many more.

Since 2017, May 5 has been set aside as a National Day of Awareness for Missing and Murdered Indigenous Women and Girls. May 5 is the birthday of Hanna Harris, a 21-year-old tribal citizen of the Northern Cheyenne Tribe who went missing and was found murdered on the Northern Cheyenne Reservation in 2013. This day, in addition to grassroots advocacy efforts and recent films *Say Her Name* and *Somebody's Daughter (1492–)*, have garnered broader public attention to the crisis (1, 2).

"I'm lucky enough that within my immediate circle I have not had anybody go missing. I've had cousins and cousins of cousins be murdered or go missing. It would almost be unbelievable to non-Native people to realize the prevalence of this issue," said Trish Hurtubise. Hurtubise is a member of the Couchiching First Nation in Ontario, Canada and works as a genetic genealogist specializing in Indigenous cases (3). She recently assisted the DNA Doe Project in identifying an Indigenous woman who had been found murdered in 1980.

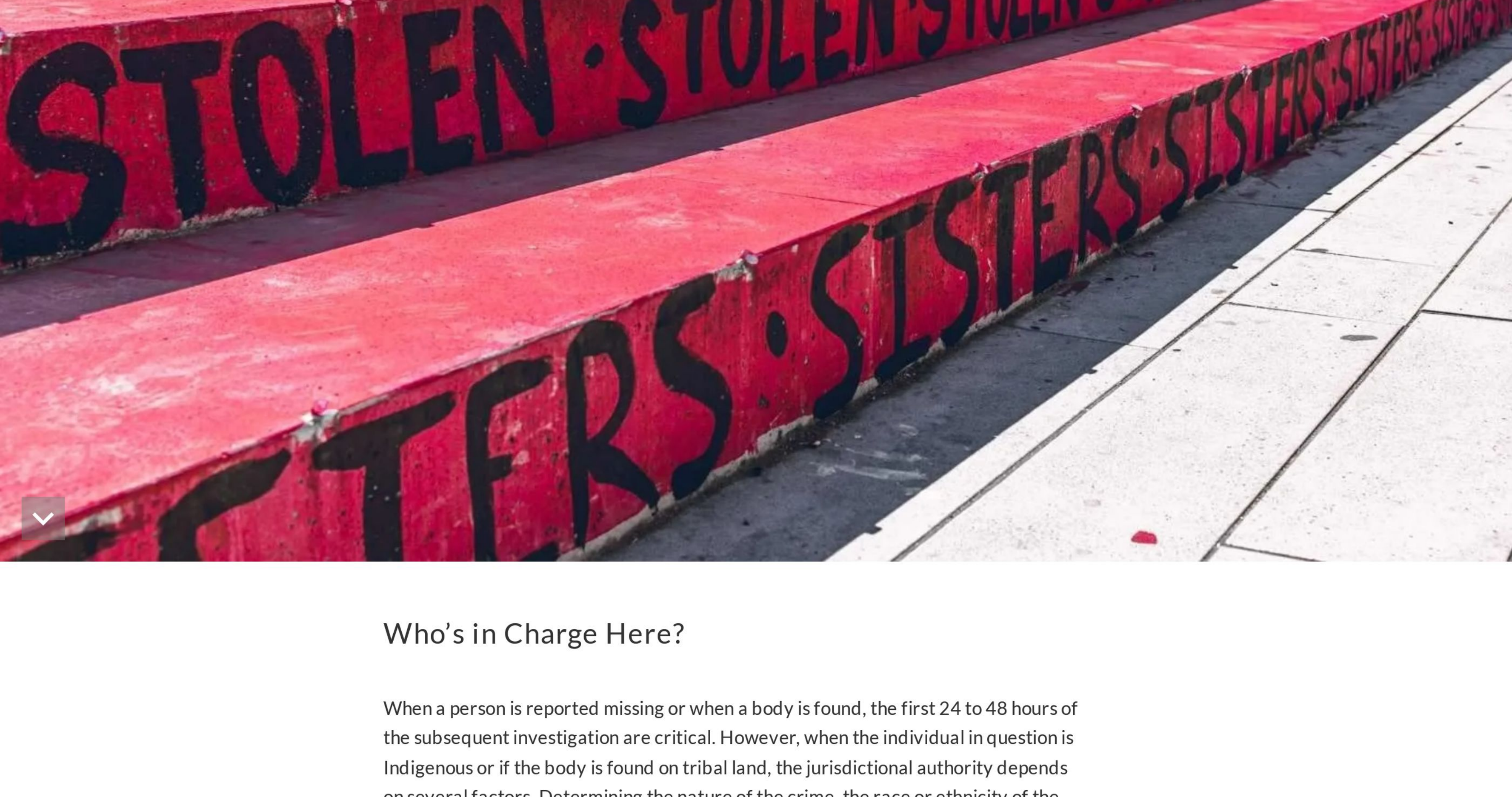
Of all groups in the United States, Native women face the highest rates of violence. According to data collected by the US Department of Justice, in some US counties the murder rates of Native women are ten times the national average. The same report reveals that Native women are almost three times as likely to experience rape or sexual assault compared to white, Black or Asian women (4). A report published in 2016 additionally suggests that interracial violence against Native women (and Native men) is more prevalent than intraracial violence, that is, most violent acts are committed by non-Native perpetrators (5).



National data on the number of missing Native women at any given time is hard to come by due to varied reporting requirements and the fluctuation of people going missing and being found again. However, the numbers that are available reveal some of the barriers to addressing the crisis. According to the Bureau of Indian Affairs (BIA), in 2016, there were 5,712 reports of missing Native women and girls, but only 116 of those cases had been logged into the NamUs database. Most of the collected data focuses on cases for reservation residents, but over half of people that identify as Indigenous actually live in urban areas, suggesting that these values are likely undercounted (6).

Ellie Bundy, the Presiding Officer of Montana's Missing Indigenous Persons (MIP) Task Force, shared that Native women are about twice as likely to go missing in Montana compared to non-Natives. Bundy also serves as a tribal council member and Treasurer for the Confederated Salish and Kootenai Tribes of the Flathead Indian Reservation.

The reason why this crisis of murdered and missing Indigenous women and girls exists cannot be traced to a single source, nor does it have a single solution. However, one major factor at play is the legal ambiguity and confusion regarding jurisdiction on cases that occur on tribal lands or involve Indigenous people. The pervasiveness of this crisis, in addition to the systemic structures that place Indigenous people in a position of vulnerability, represent to many a continuation of the violence Indigenous people have experienced for generations (2).



Who's in Charge Here?

When a person is reported missing or when a body is found, the first 24 to 48 hours of the subsequent investigation are critical. However, when the individual in question is Indigenous or if the body is found on tribal land, the jurisdictional authority depends on several factors. Determining the nature of the crime, the race or ethnicity of the victim and perpetrator, and the location where the crime took place all delay investigations.

"When a person goes missing, it often isn't known whether it's related to a criminal act. Figuring out if there is a link to a crime and then identifying who should investigate it takes time," wrote Bundy in an email.

The US Constitution grants the federal government the right to jurisdiction over crimes committed in Indian country where no congressional grant of jurisdiction to state government over the Indian country involved exists. Within the federal government, the BIA holds these responsibilities.

Some of the major legislation and legal rulings that grant states jurisdiction are the Major Crimes Act, the General Crimes Act and *Oliphant v. Suquamish Indian Tribe* (1978). In *Oliphant*, the US Supreme Court ruled that federally recognized tribes do not have the jurisdictional authority to prosecute non-Indigenous people for crimes committed on tribal land. Additionally, there are six states (California, Minnesota, Nebraska, Oregon, Wisconsin and Alaska) that are governed by Public Law 280, which gives the state criminal jurisdiction in all crimes committed on reservation land.

A poster from the National Indigenous Women's Resource Center (NIWC) outlines the complexity of this jurisdictional question (Table 1). "Major Crimes" refers to crimes outlined in the Major Crimes Act, which include murder and sex crimes under Chapter 109A.

Table 1. US criminal jurisdiction for crimes in Indian country.

Indian Status	Major Crimes (PL-280 State)	Major Crimes
Indian Perpetrator, Indian Victim	Tribal and State	Tribal and Federal
Indian Perpetrator, Non-Indian Victim	State and Tribal	Tribal and Federal
Non-Indian Perpetrator, Indian Victim	State	Federal
Non-Indian Peretrator, Non-Indian Victim	State	State

Source: NIWC.

Furthermore, the legal question of jurisdiction is still very much in flux. For example, the US Supreme Court recently expanded state jurisdiction over crimes committed in Indian Country. In the case of *Oklahoma v. Victor Manual Castro-Huerta* (2022), the court granted the state of Oklahoma (which is not governed by PL-280) jurisdiction of crimes committed by non-Indian perpetrators against Indians in Indian country (7).

"We have families in the state who have had to conduct their own investigations while waiting for a jurisdiction to own their case and work it," wrote Bundy. "That is absolutely unacceptable on every level."

Beyond the complex question of jurisdiction, however, legal authorities also must choose to open, investigate and prosecute cases. Furthermore, as Bundy points out, many of the people who are reported missing live in isolated, remote areas and law enforcement agencies often lack sufficient resources. As a result, victims and their cases fall through the cracks.

What is Being Done?

Thanks to tireless advocacy work and increasing public pressure and awareness, the US federal government has taken several steps to help address the murdered and missing indigenous women and girls (MMIWG) crisis.

First passed in 1994, the Violence Against Women Act (VAWA) was one of the first pieces of comprehensive federal legislation that acknowledged sexual assault and domestic violence as crimes and was designed to protect women from violence. VAWA is up for renewal every five years, with successive reauthorizations often improving and expanding upon the act's existing programs and protections. The 2013 reauthorization included provisions for crimes that occurred on Tribal lands. The latest reauthorization from 2022 expanded jurisdiction of Tribal courts over non-Native perpetrators on tribal lands, increased support for survivors of violence, including LGBTQ+ individuals, and reauthorized existing VAWA grant programs.

Congress has also passed a few acts in recent years that offer more targeted support in addressing the MMIWG crisis. Savanna's Act was passed in 2020 and aims to improve coordination between law enforcement agencies in cases of missing or murdered indigenous persons. The act was named after 22-year-old Savanna Lafontaine-Greywind, a member of the Spirit Lake Nation, who was murdered while eight months pregnant (8). In 2021, the Not Invisible Act was passed, mandating the formation of a commission to investigate ways to reduce violent crimes against American Indians and Alaska Natives. Also in 2021, Secretary of the Interior Deb Haaland announced the formation of a Missing and Murdered Unit within the BIA that will help lead and coordinate federal investigations of MMIP cases.

At the local level, many states have implemented MMIP task forces. The Montana MIP task force that Bundy serves on holds community listening sessions, provides testimony in relevant upcoming legislation, works to educate community and law enforcement members, and more.

A lot of this work involves educating Native peoples about the risks they face and equipping them with the knowledge to protect themselves and each other.

"I have only presented to one high school so far, but the experience made me realize that I need to get into all of our reservation schools," wrote Bundy. "About 10 students approached me after to thank me and share that they had no idea about the reality of this, one even stating 'Those girls you shared stories about were just like us.'"

On an individual level, there are also people taking steps to support safe and whole Indigenous communities, who find themselves not only facing the current injustices of the MMIWG crisis, but also the ripple effects of past injustices that separated Native peoples from their families and tribes.

Hurtubise started her work as a genealogist when searching for her half-brother. He had been separated from their family during Canada's "Sixties Scoop", a series of government policies, including residential schools, where Indigenous children were placed in non-Native families. Similar schools were setup in the US to remove Indigenous children from their families and cultural influences. Using genealogical tools and online DNA databases, Hurtubise managed to identify and reconnect with her half-brother. She now specializes in using genetic genealogy to help connect other Indigenous families.

Last year, Hurtubise launched Indigenetics, a non-profit aimed at expanding representation of Indigenous profiles in genetic databases. Since the organization is predominantly supported through volunteer efforts, Hurtubise has been sewing and selling ribbon skirts to help fund a group website, informational mailers and DNA ancestry kits.

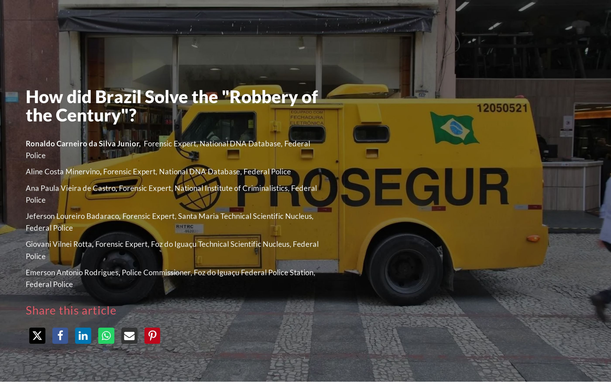
As a frequent user of genetic databases in her work, Hurtubise notes that current databases are in a woeful state when it comes to representation of Indigenous people. Often, Native profiles are lumped in with other racial and ethnic groups, like Hispanic or Pacific Islander. She also encounters a lot of mistrust when encouraging other Indigenous people to submit samples to these databases. Some legal rights for Indigenous people, freedom of movement, for example, are intimately tied to genetic identity and are contingent upon an individual's ability to prove their percentage of Indigenous blood is at least 50%. The people Hurtubise talks to are concerned that adding their genetic data to these databases could potentially be used against them to take away those rights.

Hurtubise's hope is that these profiles will help connect separated families and identify remains from residential schools and missing persons cases. Identification of these remains can offer answers for grieving families and communities and help bring closure and healing.

For those within the forensics community, Hurtubise urges: "Create safe spots for people to do their tests and become an ally to this battle of identification. Take on cases. We're identifying remains that have been found, but there are going to be future remains. We're dealing with past, present and future right now, and it's a monumental task and it's a monumental sadness."

References

1. Rain (2021) Somebody's Daughter (1492–). Alter-Native Media. https://www.somebodysdaughter.com/somebodys-daughter-the-film
2. Rain (2021) Say Her Name. https://www.somebodysdaughter.com/say-her-name-the-film
3. For a note on terminology, see: https://americanindian.si.edu/nk360/informational/impact-words-tips (accessed Aug. 5, 2022)
4. Bachman, R, et al. (2008) Violence Against American Indian and Alaska Native Women and the Criminal Justice Response: What is Known. https://www.ojp.gov/pdffiles1/nij/grants/223691.pdf
5. Rosay, A. B. (2016) Violence Against American Indian and Alaska Native Women and Men: 2010 Findings from the National Intimate Partner and Sexual Violence Survey. National Institute of Justice. https://www.ojp.gov/pdffiles1/nij/249736.pdf
6. Urban Indian Health Institute (2018) Missing and Murdered Indigenous Women & Girls. https://www.uihi.org/resources/missing-and-murdered-indigenous-women-girls/
7. *Oklahoma v. Castro-Huerta*, 597 U.S. (2022)
8. Pao, M. (2020) Savanna's Act Addresses Alarming Number of Missing or Killed Native Women. *NPR*. https://www.npr.org/sections/live-updates-protests-for-racial-justice/2020/09/28/917807372/savannas-act-addresses-alarming-numbers-of-missing-or-murdered-native-women



How did Brazil Solve the "Robbery of the Century"?

Ronaldo Carneiro da Silva Junior, Forensic Expert, National DNA Database, Federal Police

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Ana Paula Vieira de Castro, Forensic Expert, National Institute of Criminalistics, Federal Police

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Before dawn on April 24, 2017, the Paraguayan city of Ciudad del Este – an important trading hub between Brazil, Paraguay and Argentina – was besieged by heavily armed criminals. For hours the city was terrorized by gunfire and violence. Streets were blocked and vehicles set on fire. The criminals' target was the main cash-transit company in the region, Prosegur, which has a large central hub in that city. After the robbery, the criminals fled to Brazil, carrying more than 11 million dollars stolen from the company.

At daybreak, all the newspapers reported what had happened. Faced with a crime of enormous proportions, unprecedented in the region, they soon began to call this event the "Robbery of the Century" [1].

This triple border region has a Tripartite Command, which enables police collaboration between the cities of Puerto Iguazu (Argentina), Foz do Iguaçu (Brazil) and Ciudad del Este (Paraguay) [2]. In this context, the Brazilian Federal Police acted from the beginning, conducting the crime scene investigation and forensic analysis.

In the following hours, a house used by the gang as "headquarters" was located in Ciudad del Este. There were dozens of objects with potential for genetic analysis and identification of criminals. In addition, several other crime scenes interconnected with this robbery were located, such as more than ten vehicles stolen during the escape and some shootings sites where bags and backpacks were abandoned.

The forensic work culminated in the collection of 457 traces with potential use for genetic exams. All were sent to the DNA laboratory of the National Institute of Criminalistics, in Brasília (Federal District). At that time, cases commonly received by the laboratory had an average of 4 to 5 related traces. In this way, the Prosegur case represented the equivalent of 100 ordinary cases, which was a great challenge.

As an urgent and priority investigation, the laboratory team had to dedicate itself fully to this case. The laboratory experts were divided into groups: a group responsible for sampling, analysis of results and writing of reports and a group dedicated for laboratory benchwork, responsible for all workflow from extraction to genotyping. In addition, two experts were dedicated to process reference materials and one expert was responsible for managing the DNA Database. All of this was coordinated by the head of the laboratory, who communicated between the laboratory experts, the investigation team and the Directors.

Many of the traces were analyzed in the first ten days after the materials were received at the laboratory. It helped to keep some of the suspects arrested in prison. At the end of processing all materials, around 580 samples were obtained and analyzed, which generated 47 different genetic profiles, 11 of which with identified sources.

Since 2013 Brazil has an Integrated Network of DNA Databases (RIBPG) that aims to share and compare genetic profiles stored in the DNA Databases of the States, the Federal District and the Federal Police [3]. Nowadays, RIBPG has one national database and twenty-two local databases that are located in the DNA laboratories of the Federal Police, the Federal District and 20 Brazilian states. They all communicate with the National DNA Database, which allows for the exchange of genetic profiles at an interstate and interagency level.

Currently, the Brazilian National DNA Database has more than 150,000 genetic profiles [4], being the largest DNA Database in Latin America. Most of these are genetic profiles of convicted offenders, who have had their DNA collected as permitted by Brazilian criminal law [5].

In view of this existing structure in Brazil, the genetic profiles obtained from the Prosegur case were uploaded to the RIBPG databases. In National and Federal Police DNA Databases, 17 profiles matched with other profiles from 21 unrelated crime scenes, resulting in the identification of 7 more individuals. These matches linked the Prosegur robbery in Paraguay to crimes in six different Brazilian states between 2013 and 2020, committed by a large criminal organization, the First Capital Command (PCC).

Among the individuals already tried and convicted, the penalties applied for participating in this robbery ranged from 24 to 34 years in prison, plus a fine. This was the largest case ever analyzed by a DNA laboratory in Brazil and helped to demonstrate to the country's institutions that the evidence obtained by DNA tests can be essential for the application of justice.

Furthermore, the numbers and results obtained in this study represent a unique situation not directly comparable with other studies, both on controlled samples and on real casework samples. Due to this scenario, which is unprecedented in the scientific literature, the detailed analysis of this case made it possible to carry out an extensive study about the nature of the biological traces collected at real crime scenes and the respective obtainment of interpretable genetic profiles.

Briefly, the following results were observed regarding the categories of samples obtained:

- the 457 pieces of evidence collected can be divided into 45 different types of biological traces and substrates;
- 94% of the samples obtained can be classified into four major biological trace groups: wearer DNA, buccal epithelium/saliva, "touch DNA" and blood;
- Wearer DNA was the most common biological trace, sampled from 271 items of 14 different types, ranging from clothes and shoes to bed linen, bath towels and ballistic vests.

Regarding obtaining interpretable genetic profiles, the following was observed:

- 42.7% of the samples of buccal epithelium/saliva resulted in interpretable genetic profiles (84.8% of the samples amplified), being the type of biological trace with the best results;
- 24.4% of the samples of wearer DNA resulted in interpretable genetic profiles (55.9% of the samples amplified);
- only 6.4% of the samples of "touch DNA" resulted in interpretable genetic profiles (17.8% of the samples amplified);
- considering the total samples obtained, the overall DNA yield was 41.6% and the DNA profiling success rates were 23.9%, respectively. Considering only amplified samples, the profiling success rate was 57.7%;
- About 88.4% of the genetic profiles eligible for comparisons were obtained from wearer DNA (47.8%, proportional to the great number of traces received) or buccal epithelium/saliva samples (40.6%, proportional to the expected large amount of intact DNA in these samples).

On the substrates, the following results were obtained:

- The substrates that most resulted in interpretable profiles were cigarette butts, underwear, towels, balaclavas, pants/shorts and t-shirts;
- Substrates such as soap, hair, toilet paper, license plates, ammunition, ballistic vests, drain lid and miscellaneous packaging did not result in reportable genetic profiles.

Thus, the analysis of the data obtained during the DNA exams of the "Robbery of the Century" helped the scientific and forensic community. Furthermore, such a study is now a guide for forensic experts who work at crime scenes with regard to the main traces that can be collected and that have a greater chance of offering interpretable genetic profiles and, consequently, greater possibilities of identifying criminals.

The investigation of this crime, strongly based on forensic genetic exams, reached international repercussions. In 2020 the "Robbery of the Century" was selected the DNA Hit of the Year, a recognition of the value of DNA database technology to solve and prevent crime [6]. Currently, this case serves as proof of the efficiency of forensic genetics in solving crimes and in combating criminal organizations.

This manuscript summarizes the results presented in the article "The 'Robbery of the Century': the biggest Brazilian forensic genetics case", recently published in Forensic Science International: Reports [7].

During the 33rd ISHI, Ronaldo will chair the 13th GCLAITH Meeting, another event of great relevance to the forensic community in Latin America and sister countries. The last "pandemic" years have brought us many challenges. But they did not prevent technological and scientific advances, including in the area of forensic genetics. Many changes have taken place and we are in a phase of re-adaptation, including in the model of our meeting this year: for the first time hybrid!

Therefore, this is an opportunity to return to face-to-face events, without excluding the option to participate remotely. Inspired by this moment of transformation, we will make the 13th edition of the GCLAITH Meeting in a different way, in the format of discussion panels, with the central theme: "**A New Approach to Forensic Genetics in Latin America**"

This year's GCLAITH Meeting proposal is its own innovation! We intend to form discussion panels on topics that directly affect the future directions of forensic genetics. The idea is that different laboratories bring examples, doubts and limitations of their respective countries to the discussion, so that we can evolve in a collaborative way in our region. A full agenda is now live on our website.

References

[1] N. Chavez, 'Robbery of the century': 8 arrested in neighboring Brazil (2017), https://edition.cnn.com/2017/04/25/americas/paraguay-vault-robbery/

[2] F. Bordignon, International Police Cooperations on Borders, from Local to Global: The Tripartite Command at the Triple Border Argentina, Brazil and Paraguay, Dissertation (Master in Society, Culture and Borders) - State University of Western Paraná (2019), http://tede.unioeste.br/handle/tede/4412

[3] BRAZIL, Decree 7,950 - Establishes the National DNA Database and the RIBPG (2013), http://www.planalto.gov.br/ccivil_03/_ato2011-2014/2013/decreto/d7950.htm

[4] RIBPG, 16th Integrated Network of DNA Databases Report, (2022), https://www.gov.br/mj/pt-br/assuntos/sua-seguranca/seguranca-publica/ribpg

[5] A. C. Minervino, R. C. Silva Junior, M. F. Mota, C. H. F. Matte, D. Koshikene, J. P. S. C. Oliveira, T. Hessab, B. R. Trindade, G. S. Jacques, S. T.G. Ferreira, E. A. Lima, C. C. Felipe, Increasing Convicted Offender Genetic Profiles In The Brazilian National Dna Database - Legislation, Projects And Perspectives, Forensic Sci. Int. Genet. Suppl. Ser. 7 (1) (2019) 575-577, https://doi.org/10.1016/j.fsigss.2019.10.095

[6] M. Taylor, Brazilian 'Robbery of the Century' Selected as 2020 DNA Hit of the Year, Forensic Magazine (2020), https://www.forensicmag.com/565584-Brazilian-Robbery-of-the-Century-Selected-as-2020-DNA-Hit-of-the-Year/

[7] R. C. Silva Junior; A. C. Minervino; A. P. V. Castro; J. L. Badaraco; G. V. Rotta; E. A. Rodrigues. The 'Robbery of the Century': the biggest Brazilian forensic genetics case. Forensic Sci. Int. Rep. 5 (2022), 100262, https://doi.org/10.1016/j.fsir.2022.100262

Spotlight On

DNA for Africa

Conversation with Vanessa Lynch, DNA for Africa

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In September 2017 in South Africa, Sikhangele Miki was sentenced to 15 life terms and an additional 120 years. The Court referred to Miki as "a monster lurking in the shadows - attacking, robbing and raping girls, exploiting the vulnerability of his unsuspecting victims - whose crimes fell into the category of the most serious cases this court has ever dealt with".

The breakthrough in the investigation happened when Miki was arrested and convicted for an unrelated charge of common assault in 2014. Whilst serving time for this in prison and in terms of the recently passed DNA Act in South Africa in 2015, police were mandated to collect DNA samples from all convicted offenders retrospectively, and run the resultant forensic DNA profile through their national DNA database for a comparative search. In this case, it contained the DNA profiles of an unknown male in 30 separate rape cases and this is what ultimately linked Miki to the unsolved rapes, although the DNA sample was collected for a less serious and unrelated crime.

Working Together for a Safer Africa

It was among these reasons that Vanessa Lynch led the charge under the 'DNAforAfrica' banner to demonstrate the value of forensic DNA profiling in crimes against humanity and gendered violence throughout Africa. This was preceded by her efforts in South Africa where she lobbied to help pass the DNA Laws which now govern South Africa's DNA Database of over one million. Serial offenders such as Miki have been linked to not only 30 but up to 100 rapes committed by a single perpetrator, all through the South African DNA database.

Following the success of the DNA database program and adoption of DNA laws in South Africa, Vanessa launched DNAforAfrica in 2021.

We caught up with Vanessa to talk about this latest initiative.



What is the philosophy behind DNAforAfrica?

DNAforAfrica is dedicated to the use of advocacy outreach and forensic expertise to aid the development of DNA databases and casework programs throughout Africa. We have convened high level scientific workshops for forensic practitioners, as well as hosted two forensic DNA symposiums in South Africa and Kenya over the course of the last year. These DNA events provide a platform for key forensic specialists and change advocates to interact and present innovative solutions to the unique challenges faced by many countries in Africa in the fight against sexual violence and crime. It has also afforded the forensic community in Africa an opportunity to learn more about the role and potential of DNA in a criminal justice system.

What do you hope to achieve?

Our goal is to help find solution-based action in the fight against crime in Africa. We do this by adopting a holistic approach, which we call **#CATCH**

#CAMPAIGN: We support campaigns which advocate for the inception of DNA policies and laws

#ACQUAINT: We help educate administrations and the public on why forensic DNA is important and how it aids to both deter and detect offenders.

#TRACK: We track the establishment and growth of DNA Databases and forensic DNA labs throughout Africa, as well as monitor the reduction of DNA Backlogs.

#CAPACITATE: We help to ensure that the appropriate DNA capacity is in place to support the implementation of DNA policies and laws.

#HIGHLIGHT: We identify and highlight obstacles such as DNA backlogs, lagging DNA policies and limited DNA capacity, offering solutions to redress these roadblocks to help combat crime.



Attendees at the Forensic DNAforAFRICA Symposium held in Nairobi, Kenya in June of this year.



Photo Credit: Mia Lynch

What are your highlights?

Along this journey I have been honoured to have had the opportunity to engage with and learn from so many passionate and dedicated change makers, many of whose career's span over 35 years, and I am grateful to them for contributing their expertise and insights to this cause. DNAforAfrica is a story of mentorship, collaboration, dedication and hope which I attribute to our army of "DNA Crusaders" who are as passionate about change as we are. In bringing together a multitude of international and local forensic experts and activists, all of whom share a passion for forensic science and crime resolution, we are able to explore an integrated approach to resolving crime through best practices and lessons learned.

Collaboration

DNAforAfrica has also partnered with organizations such as ICRC, the UNODC, Interpol, SADC and the Africa Union Commission to raise awareness for the need for greater use of forensic profiling throughout Africa.

What has been the benefit of these collaborations?

These organizations adopt a survivor-centred approach to crime resolution, and I have found that collaborating with these agencies helps promote adherence to humanitarian principles and the rights of affected victims and communities. This is particularly relevant when addressing those in the justice and medicolegal sectors, where vulnerable and distressed victims deserve the highest levels of professionalism and scientific rigor without compromising on empathy, respect, and dignity. It has taught me that to comprehensively combat sexual violence, it is necessary to address both the well-being of survivors and the crimes of the perpetrators.

Further, encouraging countries to engage with each other and share in each other's knowledge, policies and expertise is key. We do not have to re-invent the wheel as we are best placed - as part of the greater Africa community - to understand what is required in low resourced environments. I always say to my colleagues and change advocates working in Africa that together, we are DNAforAfrica!

Funding

DNAforAfrica have also highlighted the need for donor funding to support DNA programs in Africa.

Why do you think funding these DNA programs is necessary?

With the high level of expertise I have found in Africa amongst forensic scientists and practitioners, coupled with their commitment and dedication to their work, I have also seen that they are severely limited in having access to the tools required to fully develop their DNA programs. This all comes down to funding and we are exploring ways in which to help countries in Africa access global funding programs which are dedicated to the prevention and resolution of crimes against humanity, including sexual violence and trafficking in persons through the better utilisation of forensic DNA programs.



Vanessa with human trafficking advocate, Malaika Oringo, from Footprint to Freedom

So, what's next?

We have started developing a 'DNA toolkit' for African countries looking to advance their DNA database and infrastructures as well as exact DNA policies and laws to support these efforts. It is our vision that in the next 2-5 years, we will have made a significant impact in Africa where we will see administrations adopting DNA laws, funding their own DNA programs, and ultimately preventing tomorrow's victims.

Any more events we should look out for?

This year we are moving to Dar es Salaam in Tanzania, where we are partnering with the UNODC, SADC and Interpol for a weeklong series of in-person workshops, discussions and presentations on how best to implement DNA programs in 16 Africa countries. We then move to Ghana in the last quarter of 2022 where we are collaborating with Prof. Budowle who will be leading an in-person high level scientific workshop for the West Africa scientific community. Next year we are planning a fantastic event with the ICRC and the African Union Commission in Cape Town, so watch this space!



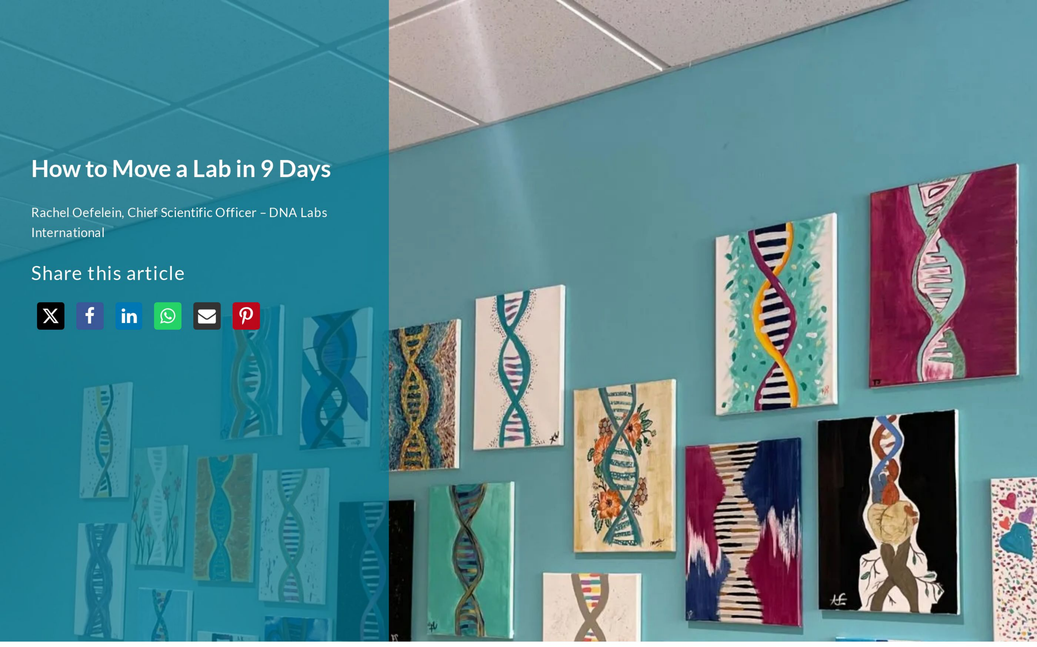
Vanessa with forensic scientist Dr. Bruce Budowle

Follow Vanessa's journey and join the conversation @DNAforAfrica

About Dr Vanessa Lynch:

Vanessa founded The DNA Project in 2005, and in 2021 launched @DNAforAfrica, dedicated to the use of advocacy outreach and forensic expertise to aid the development of DNA databases and casework programs throughout Africa. Vanessa is regarded as a key opinion leader in the field of Forensic DNA policy and law has been lauded for her leadership to drive the adoption of legislation to administer South Africa's national DNA database, the first of its kind on the African continent. Vanessa served as Deputy Chair of the National Forensic Oversight and Ethics Board (SA) which monitored the implementation of the provisions of the DNA Act in its first five years and now serves on the Forensic Databasing Advisory Board (FDAB) for the International Society of Forensic Genetics (ISFG).

Vanessa completed her Law degree at the University of Cape Town and Doctorate of Laws in Forensic DNA Profiling and Ethics at the University of Stellenbosch.



How to Move a Lab in 9 Days

Rachel Oefelein, Chief Scientific Officer – DNA Labs International

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There comes a point in time at most laboratories when it seems that every pipette rack is full, every bench has an instrument on it, and you've run out of desk spaces for new personnel. This can only mean one thing, the dreaded move of your laboratory into a larger facility. Moving in general, even to a new apartment, can be a very stressful process. A forensic laboratory move comes with a whole new set of challenges: designing your new space for optimal performance, selecting movers, scheduling vendor maintenance, performance checks, calibrations, maintaining accreditation, the delicate ballet of packing and moving instruments without breaking anything, analysing, and summarizing your results, communicating with your accrediting body, and ensuring that the new space can accommodate future growth.





Relocation and expansion in 2017 and 2018 served as a template for how to make the laboratory relocation in 2022 as seamless as possible. First and foremost, we had to find a new space that could accommodate both our current operations and the growth of future operations. This process started with an exact testing scheme ensuring that every instrument and every kit was tested across five different workflows, including both manual and automated workflows. Decisions had to be considered prior to finalizing the testing scheme: phased or single move, cost/risk analysis, timing of scheduling movers and field application scientists' visits, and how to keep your staff sane for a very busy 9 days!

Prior to the move, additional laboratory casework was prioritized so we could keep our remote staff busy while those on-site got us up and running at our new digs. Our accrediting body was notified as soon as move dates were finalized so our post-move assessment could be conducted in a timely manner. We opted for a single phase move with all instrumentation, computers and hardware, supplies, chemicals, and evidence moving over two days. Once everything was moved into their respective places it was time to bleach, and then bleach some more, and then bleach even more! The laboratory had to be free of any extraneous DNA before the laboratory-wide test could begin. The testing scheme incorporated on-site visits from vendors so that as soon as instruments went through their maintenance, their performance checks began. There was staff dedicated to the summary of all performance checks so that as data became available it was immediately incorporated into the summary. Fast forward 9 days later, after many long nights and countless Uber Eats deliveries, the final move summary was signed and authorized. We were officially live for casework!





Moving into a new facility is not just about finding the best shelf to store the 1.5 mL tubes though, it is also about making it an environment that people are excited to come to work in every day. A new facility means leaving behind an old facility filled with memories, victories, and life moments. Throughout the years staff not only contributed to solving crime in our previous laboratories but they also announced engagements and expecting little ones! Staff and interns came and went as the years went by, instruments that we had spent countless hours with were retired for shiny new models. New technology was innovated within those walls! Personal touches were introduced into the new laboratory, some of which were throwbacks to where we came from to remind of us of who we are and what is to come. A DNA Paint and Pour night was introduced to help gather us together to decorate our new home away from home. So now that months have gone by, we look forward to the our ever-competitive annual pumpkin carving contest to be held at the new laboratory for the first time and have settled into what we do best, helping provide DNA support to law enforcement throughout the United States and the world.

Lots of love,

The DLI Family

An Update from the Organization of Scientific Area Committees (OSAC) for Forensic Science

Robyn Ragsdale, Chair of OSAC's Biology Scientific Area Committee and Beth Ordeman, Chair of OSAC's Human Forensic Biology Subcommittee

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NIST & AAFS Cooperative Agreement: Helping to Put Standards Implementation into Action

The Organization of Scientific Area Committees (OSAC) for Forensic Science's Human Forensic Biology Subcommittee drafts standards and guidelines related to training, method development and validation, data analysis, interpretation, statistical analysis, and reporting and testimony for human forensic serological and DNA testing.

OSAC, which is administered by the National Institute of Standards and Technology (NIST), facilitates the development of, reviews, and posts high-quality forensic science standards to the OSAC Registry. Inclusion on the OSAC Registry indicates that a standard is technically sound and that laboratories should consider adopting them. The OSAC Registry currently contains 13 DNA standards (11 published by a standards developing organization (SDO) and two OSAC Proposed), related to validation, training, interpretation, and quality assurance.

In late 2021, NIST entered into a cooperative agreement with the American Academy of Forensic Sciences (AAFS) to develop tools, training, and resources to assist with standards implementation efforts. One of these resources, Standard Factsheets, provide a clear, concise, and easy way to understand the purpose of a specific standard, why it is needed, and the benefits of adoption. These factsheets can be used by forensic scientists when interfacing with non-scientific stakeholders, such as attorneys and law enforcement. Factsheets are currently available for these three DNA standards on the OSAC Registry:

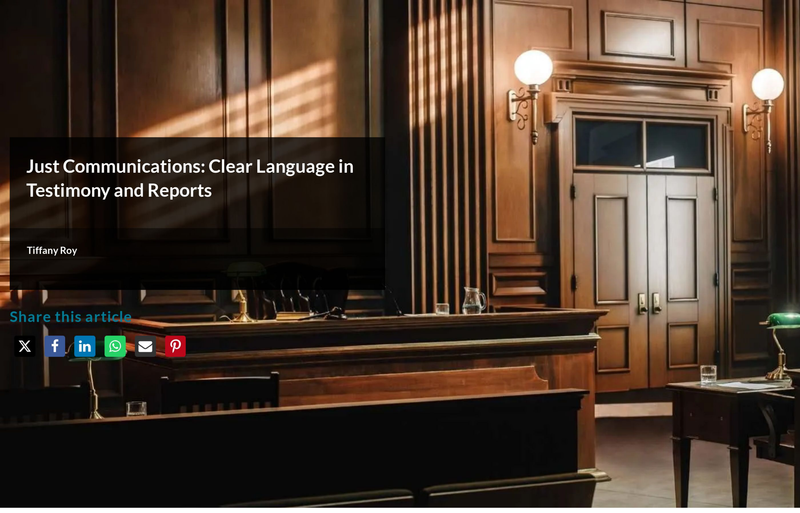
- ANSI/ASB Standard 018, Standard for Validation of Probabilistic Genotyping Systems, First Edition, 2020.
- ANSI/ASB Standard 020, Standard for Validation Studies of DNA Mixtures, and Development and Verification of a Laboratory's Mixture Interpretation Protocol, First Edition, 2018.
- ANSI/ASB Standard 040, Standard for Forensic DNA Interpretation and Comparison Protocols, First Edition, 2019.

As another part of this cooperative agreement, AAFS will be developing checklists that forensic science service providers can use to track progress towards implementation, identify gaps, and provide objective evidence of implementation or compliance. The first six checklists, including one for ANSI/ASB Standard 040, are currently being finalized and will be revealed at the upcoming Association of Forensic Quality Assurance Managers (AFQAM) Training Conference this October. In addition to the AAFS checklist, OSAC's Human Forensic Biology Subcommittee has also developed an assessment guide and worksheet that laboratories can use to help evaluate whether they have met the requirements listed in section 4 of ANSI/ASB Standard 040. This assessment guide and worksheet are available on the subcommittee's webpage.

We want to know how your laboratory is using the standards on the OSAC Registry and how we can help you put implementation into action! Each year, OSAC assesses the state of Registry implementation through a survey. The 2022 OSAC Registry Implementation Survey, which provides an assessment of 95 standards posted on the Registry, is open now and will close late August. There's still time to participate and join more than 90 other forensic science service providers who have already submitted responses! For more information about the survey and to share your feedback, visit the OSAC website.

To learn about OSAC's activities or to join, visit www.nist.gov/osac or contact forensics@nist.gov.





Just Communications: Clear Language in Testimony and Reports

Tiffany Roy

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A major challenge in forensic DNA is ensuring results are communicated in a way that ensures they are being understood. A great deal of thought goes into crafting report templates for standardization and readability. We know, as experts, these reports are being consumed by justice partners, including law enforcement investigators, judges and magistrates, and lawyers. These people are tasked with making important decisions that affect the life and liberty of criminal defendants. In the United States, a common trend is to keep reports short and sweet. If longer explanations are required, those discussions are often left for testimony. Report brevity can leave some ambiguous terms open for interpretation absent further explanation.

The way we communicate science to our end users is vitally important. Legal decisions are being made based on reports *before* trial and our words *during* trial. In recognition of those important decisions, efforts must be made not only to convey the most important components of our results, but also aspects that are more nuanced that could lead a lay person to misunderstand the strengths and weaknesses of the evidence presented. To ensure full understanding, greater efforts must be made to prevent possible misunderstanding. One way this can be accomplished in forensic DNA reports and testimony is through transparency and intentional language.

In every DNA report, there are required elements. The FBI Quality Assurance Standards and ISO 17025 set forth minimum information that must be described in every report, like sample descriptions and loci tested. However, some of the more nuanced information is left up to the laboratory to decide what they want to describe and define in more detail. Language that has snuck into our lexicon from our exposure to the legal system is sometimes used as a matter of custom. One example of this is the phrase, "to a reasonable degree of scientific certainty." The National Commission on Forensic Science recommended against its use in testimony and reports because it really has no meaning in science. As a community, forensic DNA analysts need to critically consider each word or phrase being used to describe results for clarity.

One example of a term that has high potential to mislead a lay person is the term "sperm fraction." In forensic DNA, we use it to describe the resultant parts of the differential extraction process, ie "sperm cell fraction and non-sperm/epithelial cell fraction". With more laboratories moving away from serology screening to Y screening methods in sexual assault cases, using the word "sperm" might mislead a layperson into thinking sperm were identified on a sample when it was not. Forward thinking labs have renamed the fractions and the process is being clarified in reports. One great example of a clarification from a US lab states,

"A differential extraction two separate processes. The first process isolates the portion of the sample that may contain DNA from nucleated epithelial cells, white blood cells or buccal cells, and is referred to as the F1 fraction. The second process isolates the portion of a sample that may contain DNA from spermatozoa and is referred to as the F2 fraction. The use of a differential extraction does not imply the presence or absence of spermatozoa."

In courtroom testimony, it has become increasingly important not only the state clearly what the DNA results mean, but also what they do not mean. As labs move from binary interpretation models and frequentist statistics to probabilistic genotyping and Bayesian statistics, serious thought should be given in reports and testimony to making clear how the two are different to prevent association fallacies. One association fallacy which presents routinely in court is (commonly a lawyer) equating the magnitude of the LR with uniqueness. A simple way this can be avoided is by including language in reports that states clearly, "no likelihood ratio, of any magnitude, should be taken to imply the person being compared is the unique source of the DNA on the evidence." In testimony, likelihood ratios are often put into perspective by lawyers referencing the population of the planet, which is approximately 7 billion. Analysts should make clear in testimony that the likelihood ratio has no relation to the population of the planet, and even when it far exceeds the population, it doesn't mean the person compared is the source of the DNA.

As previously discussed in an earlier installment of *Just Communications*, analysts are frequently asked questions about *how* the DNA could have gotten onto the item. Lawyers pose hypothetical questions that frequently call for explanations of the case evidence, leaving the analyst to acknowledge a list of possibilities which may or may not be helpful to the court. Because most US laboratories operate on the sub-source level of the hierarchy of propositions, the results being reported answer only questions of *who* could be a potential contributor and not *how* the DNA came to be present on an item. To head off some of the questions about activities, analysts should consider including a statement in their reports and testimony that makes clear, "the reported results address propositions regarding *who* could be a potential contributor and they do not address propositions about *how* the DNA came to be on the item."

These clarifications go a long way in heading off commonly encountered trouble spots where DNA results could be misinterpreted by lay people. Especially in courtrooms where analysts have little to no control over how their results are described by lawyers in opening and closing statements, making these clarifications in reports and testimony help to prevent misinterpretation and misuse of forensic DNA results. While we may not have control over what questions are being asked of us in court, we have wide latitude to define and describe terminology in our reports and conclusions. Words mean different things to different people, and it's the onus of the analyst to ensure their results are understood fairly and accurately by the people tasked with determining guilt or innocence in a criminal court.

Tiffany Roy will be chairing the "Implementation of Information Management Tools in DNA Casework" Workshop on November 3rd this year.

This workshop will introduce practical tools for practitioners to implement information management procedures using the Linear Sequential Unmasking-Expanded approach. The workshop will begin with a background presentation on key concepts in human factors and the importance of information management in forensic casework. The introduction is followed by group activities on the general human factors concepts. Once the general concepts have been covered, presenters will cover concepts specific to linear sequential unmasking and linear sequential unmasking-expanded and other impact mitigation techniques for cognitive bias in forensics. A practical tool for implementation of LSU/LSU-E will be provided and the participants will be divided into groups. Each group will work through examples using the worksheet to classify different types of information/communications which could be encountered in casework. The groups will practice documenting and categorizing information based on biasing potential, subjectivity, and task relevance. Participants are encouraged to bring examples of communications or information received in their past casework or communication logs from closed cases to practice with the worksheet. Following the practical exercises, there will be a discussion to compare and contrast how the participants classified each piece of information and and time for any questions that may have come up.

Learn more and register on our website.





Get to Know the ISHI 33 Speakers

Tara Luther, Promega

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Before heading to ISHI (or logging on virtually) this year, let's get to know some of the ISHI General Sessions speakers a little better.

What tips would you give to someone who is just starting out in the field of forensics, or what is the best advice that you've received?



Sylvain Hubac: The best advice I've received: always give the best of yourself and keep the team spirit.

Abigail Bathrick: For students considering going into forensics, I recommend talking to people already working in the field. Internships and conferences are a great way interact with forensic professionals.

Nicole Richetelli and Austin Hicklin: Expose yourself to a variety of different forensic disciplines in both study and in practice (internships, research, shadowing, etc.). Not only will this help you to decide on your career path, but the critical thinking that you learn and the knowledge of the principles and methods used in one discipline may help you to better understand or inspire new innovation in another discipline.

Ray Wickenheiser: The best advice that I have received is that we are scientists who are neutral and go where the data leads us. We develop and utilize methods that can shed light on who did and did not commit this crime. We must be objective, and let the data speak for itself.

Julie Sikorsky: This is a career; it is not a job. Perfection is expected. It requires dedicated individuals to work hard and do the right thing the right way, all the time. The rewards are immeasurable.

Tim Kalafut: I would advise students that are interested in forensics to get comfortable speaking in front of people. Join a campus club and run for leadership so that you have to speak in front of people. If you play an instrument or sing, find a place to perform. Do whatever it takes to become comfortable in front of an audience. Because you have an audience at court, and at any one moment during the trial, it might feel like half of your audience hates you. Yet you have to be neutral, calm, and professional at all times. If you have no other option, try the Toastmasters International organization.

Cheryl Carreiro: Ask a lot of questions and learn as much as you can from your veteran co-workers.

If you had to pick one thing, what do you enjoy most about your job?

Sylvain Hubac: Serve justice and protect citizens. In DVI context, the best reward is to have allowed families to find their relatives.

Abigail Bathrick: As a research scientist, I like having the opportunity to evaluate new technologies.

Nicole Richetelli and Austin Hicklin: Forensic science has a fascinating variety of details in its various disciplines, and the work is greatly rewarding. Every day is like a new puzzle.

Ray Wickenheiser: I really enjoy the passionate people who join our field of forensic science, bringing their energy, enthusiasm, and brilliance to help solve crime with objective science. We get to work with a great group of folks.

Julie Sikorsky: Knowing that what I do (and love to do) on a daily basis has the potential to make a difference in people's lives, bringing them closure and security.

Nathan Scudder: I enjoy the people I work with, and the range of opportunities I've had over the last 23 years with the Australian Federal Police. I work with some fantastic teams, who all want to make a difference and make society safer.

Tim Kalafut: In my current job as an academic, I love the entrepreneurial component of it. I can do any project I want – as long as I find money to pay for it or collaborators to work with. I wasn't expecting that after 23 years in the crime lab where I had to do either 1) get permission for every special project, or 2) do everything according to protocol. Although you didn't ask, I had no idea that a new faculty member would be putting in 7-day work weeks of 14-hour days. That's not exactly a dis-like, but it was unexpected.

Cheryl Carreiro: Making a difference and helping the community.

If you currently work in the lab, or have in the past, what's the weirdest thing you've ever collected DNA from?

Sylvain Hubac: It was a menstrual cup during a DVI mission of a fighter jet air crash in France in 2019. I didn't know what it was at this time but i found curious the presence of this object in the snow with nothing around.

I've collected it and used a swab to collect inside. I found the DNA profile of pilot whose body was fully disintegrated upon impact with the ground.

Ray Wickenheiser: I have been blessed to have worked on a host of interesting cases, but if I had to pick one item, it would be a fragment of contact lens that I picked out of a full vacuum cleaner bag. The assailant had tricked the victim to enter a location where he assaulted and beat her, knocking out her contact lens in the process. She eventually escaped and was too afraid to report the crime until days later. Hence, no other associative evidence was available. Once the police attended the scene, it had been extensively cleaned. In an effort to corroborate her story, investigators submitted the vacuum cleaner bag to the forensic laboratory. Working with my colleagues, we were able to obtain a full DNA profile from a contact lens fragment located within the pile of debris. The major component of the mixed DNA profile matched her, and the suspect plead guilty just prior to trial.

Julie Sikorsky: The first thing that comes to mind was a broken dreadlock left behind at a home invasion.

Tim Kalafut: An old case involving a blunt force trauma had a new lead years later, resulting in a search of the woods and a river. A pickaxe was collected from the river in a big old PVC section of pipe, capped at both ends. (The handle was sawed off so both the handle and the head would fit into the pipe.) It was really, really heavy because it was full of water. Turns out, because the axe was in the water, they wanted to capture any DNA that might have been washed off. Needless to say, I didn't collect any DNA from it.

If you could have dinner with anyone (dead or alive), who would it be and why?

Sylvain Hubac: Leonard De Vinci. I totally agree with his way of thinking: "the simplicity is the ultimate sophistication".

Abigail Bathrick: David Attenborough – I think he would have the most interesting stories from a lifetime of traveling and presenting nature documentaries.

Nicole Richetelli and Austin Hicklin: Leonardo, David Bowie, Bigfoot…if Bigfoot shows up, you know the legend is true!

Ray Wickenheiser: I would choose Dr. George Carmody, professor, forensic geneticist, and statistician. George was a great friend and colleague who could make the most complex concepts understandable, interesting, and fun. He had a passion for forensic science and loved getting out and meeting crime lab scientists and sharing his knowledge.

Julie Sikorsky: Ruth Bader Ginsburg. I have so much respect for a woman, a wife, and a mother who, facing and overcoming so much adversity in her own life, sought and succeeded at living a life dedicated to fighting the inequities levied on others. She also seemed accessible, so dinner with her would undoubtedly be an easy, relaxed affair with quality conversation and good wine.

Nathan Scudder: I could detect when someone was lying, honesty is something that is very important to me in both my personal and professional life. Although if I could detect lying, I should probably be an officer or a lawyer instead of a scientist.

Tim Kalafut: Al Capone. To find out what was really in that vault….

What's one thing that others may not know about you?

Sylvain Hubac: That I may be the only French guy to attend at ISHI. If someone has never seen a French guy, this is the opportunity!

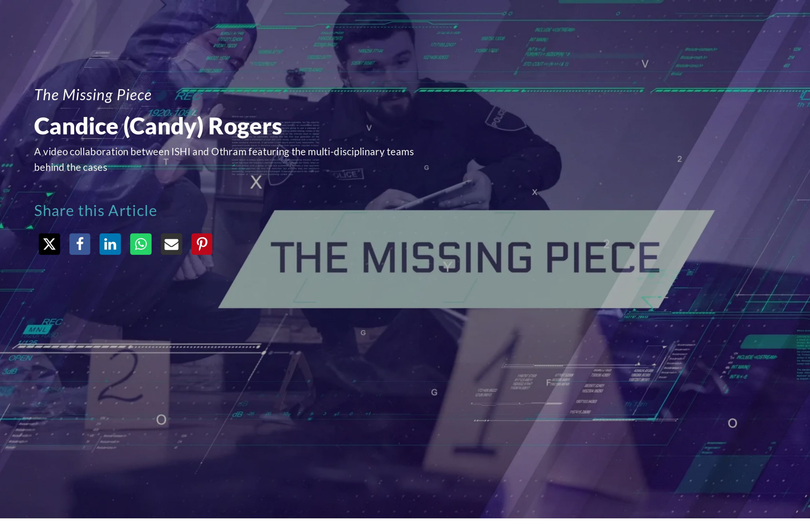
Abigail Bathrick: I read over a hundred novels last year.

Ray Wickenheiser: I enjoy playing ice hockey and play in a hockey league and charity tournaments.

Julie Sikorsky: I was a Girl Scout from brownies through seniors (there were no daisies when I started) and was even a Boy Scout Explorer in high school.

Nathan Scudder: In my Year 11 school report, my physics teacher – while giving me a passing grade - strongly suggested I stay away from the sciences. So I instead embarked on studying law. Twenty-five years later, I completed my PhD and I now manage biometrics in a forensic laboratory.

Tim Kalafut: I got shot in the head with a bow and arrow as a kid.



The Missing Piece

Candice (Candy) Rogers

A video collaboration between ISHI and Othram featuring the multi-disciplinary teams behind the cases

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For years, victims were listed on cold case files in law enforcement evidence boxes. While never forgotten, limitations in forensic science prevented their cases from being closed. Families waited decades for answers and justice while their killers remained unidentified.

In 2018, a new tool for crime solving rose to prominence as the notorious Golden State Killer was finally unmasked; forensic genetic genealogy. To begin, investigators upload their unknown DNA profile to the site, which generates a list of the closest genetic matches, based on how many centimorgans (cM) of DNA are shared with the unknown person. Next, investigators will begin to build back the unknown person's family tree until a common ancestor is uncovered. Then, they will build the family trees forward, identifying every descendent possible, using traditional genealogy techniques. Once the trees have been fully built out, investigators look to identify candidate persons that might match the unknown person. Once a person of interest has been identified, new DNA can be collected to compare to the original forensic sample.



The 1959 sexual assault and murder of the 9-year-old fourth grader was one of the oldest unsolved cases in Washington State, but using the latest technologies and techniques, investigators were able to identify her killer.

Candice "Candy" Rogers was a 9-year-old 4th grader who lived with her mother in Spokane, Washington. Candy Rogers was a member of the Bluebirds, the younger members of the Camp Fire Girls Of America. On the afternoon of March 6, 1959, she left her home to sell mints door-to-door. She had 7 boxes to sell and confined her route to her neighborhood. Within a few hours of her departure from her home, her family became worried and began searching for her. Neighbors joined in. Shortly after, the police were notified and they too began searching for the little girl. In the later evening, abandoned boxes of mints were found by the Fort George Wright Bridge, but there was no trace of Candy Rogers.

By morning, all of Spokane was aware of the situation. Her disappearance was reported in the paper that very next day. Hundreds of folks searched for the little girl. Groups including the Air Force, Maine Corp Reserve Unit, WWP, Inland Paper, International Harvester, US Postal Service, and Boy Scouts of America offered their assistance in the search. Tragically, in the course of the search that day, a Sikorsky H-19 Chickasaw helicopter, aiding in the search, hit a power line by the Spokane River and crashed. The helicopter carried five Air Force Airmen. Three of these men were killed in the crash.

Two weeks after her disappearance, two folks hunting in the area found shoes that belonged to Candy Rogers. The next morning, her body was found, purposefully concealed by pine needles and tree branches. A new manhunt began, to find the person responsible for her murder. Investigators determined that the little girl was strangled to death and that she had also been sexually assaulted. Strips of her clothing had been used to restrain her and strangle her. The investigation into her sex assault and murder spanned the careers of many law enforcement officers and continued for decades. Hundreds of tips and leads were explored. Countless persons of interest were slowly eliminated.

In the early 2000s, a breakthrough in the case came when forensic scientists were able to isolate a semen sample from Candy Roger's clothing. An STR profile was developed and entered into CODIS, however there was no match to a known identity.

In February 2021, the Spokane Police Department reached out to Othram to see if Othram's technology and methods could assist with the case. The DNA extract derived from the crime scene was degraded and burdened with non-human DNA, neither of which was surprising given the age of the case. Othram received the DNA extract in March 2021 and Othram scientists used Forensic-Grade Genome Sequencing® to develop a comprehensive genealogical profile from the DNA evidence. Upon successful construction of a DNA profile, the Othram genealogy team used the DNA profile to search for distant genetic matches that might help reveal the identity of the man who left his DNA at the crime scene. By Labor Day, Othram had returned investigative leads to Detective Zac Storment from the Spokane Police Department. The research at Othram had narrowed the search to three brothers.

Empowered by these new leads, Detective Zac Storment and his team continued their investigation and found that one of the brothers died in 1970, at the age of 30, but was survived by a wife and daughter. Investigators reached out to the daughter to see if she would be willing to help confirm whether her father or one of his brothers might be responsible for a decades-old crime. The daughter provided a DNA swab and the forensic team in Spokane was able to establish strong evidence of paternity between the unknown male DNA profile from the crime scene and the profile developed from the daughter. A search warrant was secured for her deceased father's DNA and he was exhumed so that DNA evidence could be collected. The forensic team was then able to make the final key confirmation that the profile from the exhumed body matched the profile from the crime scene.

After more than 60 years, a suspect had finally been confirmed. Investigators have now concluded that John Reigh Hoff, never previously connected to the case, is the man responsible for the sexual assault and murder of Candy Rogers. An investigation continues as Detective Zac Storment and his team try to determine if and how Hoff might have known Rogers and if Hoff might be responsible for other crimes in the area.

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